RESEARCH PROPOSAL OF THE THESIS ENTITLED

TELEMEDICINE AND HEALTHCARE ACCESSIBILITY – STUDY ON IMPACT OF TELEMEDICINE INITIATIVES ON PATIENT ENGAGEMENT IN RURAL AREAS OF GUJARAT

Submitted for the award of the Degree of

DOCTOR OF PHILOSOPHY

in Management

by

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September, 2025

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Abbreviation	Full Form
WHO	World Health Organization
ICT	Information and Communication Technology
BoG	Board of Governors
DISHA	Digital Information security in healthcare Act
FDI	Foreign Direct Investment
CHC	Community Health Center
PHC	Primary Health Center
CHO	Community Health Officer
MO	Medical Officer
ISRO	Indian Space Research Organisation
NeHA	National eHealth Authority
VRC	Village Resource Centre
SPSS	Statistical Package for the Social Sciences

Telemedicine and Healthcare-accessibility:

Study on Impact of the Telemedicine Initiatives on Patient-Engagement in Rural Areas of Gujarat

1. Introduction

Health is an important concern for societies and members of it, constituting a primary focus of daily life and a central subject of research aimed at its understanding. As a multidimensional construct, health is a critical topic universally with so much value across all demographics, irrespective of any age, gender or socio-economic background. This concept is transcending beyond the mere absence of disease, encompassing the state of complete physical, mental, and social well-being supported by environments that foster and sustain a healthy life.

The right to health, therefore, extends over a legal provision to be known as a fundamental human right that is integral to the realization of other rights. It is operationally defined as the right of every individual to access a system of health protection, including the conditions and guidelines necessary to promote and improve health outcomes. The core component of this right is the principle of equitable access, which mandates the availability, accessibility, acceptability, and quality of all health-related facilities, goods, and services be they public or private. This encompasses the full continuum of care, from accurate diagnosis and evidence-based treatment to support systems, with particular emphasis on decreasing financial barriers to access for population at disadvantage (NITI Aayog, 2020) [(1)].

The World Health Organization (WHO) has defined health as "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity." Telemedicine serves as a critically important intervention for mitigating healthcare-access inequities, especially in geographically isolated and rural communities, by facilitating consultations between distant patients and the healthcare providers. This technological modality addresses fundamental barriers like distance and the maldistribution of specialist care, thereby promoting more equitable access to medical services for underserved populations (Sood et al., 2007).[(2)] Through the enablement of real-time clinical interactions, telemedicine demonstrates significant potential to increase the quality of patients' care and decrease the critical delays in treatment initiation.

The concept of health being as a human right was officially enshrined into the 1946 Constitution of World Health Organization (WHO), which identifies the realization of the highest level of attainable health as one of the main rights a person do have (NITI Aayog, 2020). The framework resulting expresses a legal requirement on nation-states to see that health care is completely acceptable, manageable, accessible, and of sufficient quality. In addition, the right knows no boundaries in clinical care as it addresses the determinants of health, but not just as they exist at the clinical level, but as they are in the underlying level namely access to potable water, sanitation, nutritious food, appropriate housing, health educational needs and gender equality (Sood et al., 2007).

In Indian juridical context, even though the constitutional right to health is not expressly spelled out because the right to health is not expressly listed as a fundamental right in the Constitution, the right to health has been judicially construed interpreted as an inseparable right of right to life and personal liberty under Article 21. The judiciary has acknowledged that access to healthcare services is one of the key means of having a life of human dignity and includes the right

in the protective umbrella of the Right to Life because it is the judiciary that has developed through progressive jurisprudential efforts (NITI Aayog, 2020). The interpretation has strong legal grounds on the public health policy and objectives on development in India.

The Indian system maintains a pluralistic healthcare system which combines Ayurveda and Homeopathy and also allopathic medicine. However, as (Anupindi, 2012) explain there has always been significant time lapse in accessing such services particularly in the rural setting. Systemic barriers, such as infrastructural deficiency, distribution imbalances of health practitioners, and geographic isolation, contribute to unfair access to care and therefore the necessity of novel models of delivery that will guarantee a timely and efficient medical delivery to the population.

Telemedicine is becoming one of the effective answers towards these levels of access. This mode will help improve access to care in the patients and ease communication between patients and providers as well as has shown greater patient satisfaction (Sood et al., 2007). It involves the distance diagnosis, treatment, and prevention of disease and injury, as well as assists research and lifelong medical education, which is intended to enhance personal and population health outcomes. Telemedicine, also known as Healing by Wire, has emerged in the last 20 years to be a legitimate part of modern technology-based healthcare, and Information and Communication Technology (ICT) is a key facilitator to realize of global healthcare convergence (Anupindi, 2012).

There is evidence that health applications based on ICT offer scalable health solutions that are usually facing problems in most emerging and developing economies (Anupindi, 2012).

India The telemedicine regulatory framework of the country was officially instituted in place of an amendment on the Indian Medical Council (Professional Conduct, Etiquette and Ethics) Regulations, 2002. The initial official guidelines and the acceptability of the

teleconsultation practices, which is the fundamental basis of its integration into the national health-space, was provided through this amendment issued by the Board of Governors on March 25, 2020, replacing the Medical Council of India (NITI Aayog, 2020).

The Indian government has put forward legislations like the offered Digital Information Security in Healthcare Act (DISHA) with the purpose to provide a legal framework which would secure privacy, confidentiality, and security of digitally stored health information via regulating its collection, storage, transfer, and utilization (National Portal of India, 2021).

2. Review of Literature

The overall survey of the topic was performed with references to such primary sources as official recommendations by the Indian healthcare and telemedicine regulators, international conventions, and scholarly articles. In order to have a strong contextual comprehension, secondary sources such as academic books and professional analyses were also referred to.

Another study (Shilekh, 2013) was a relevant study used in the deployment of telemedicine in Guru Gobind Singh Medical College, Faridkot, India. The study revealed that there were systemic issues such as shortage of medical practitioners, high number of undecided cases and high delays during consultations. One such important barrier was found in the limitation of the patient engagement that was increased by the poor health and technical literacy rates of the patient population. The study of 3,050 telemedicine visits in 2010-2012 showed that only 57.2% were effectively finished and 37.8% were left unattended and 5.0% took place through the proxies. Such findings do highlight the need to advance operational guidelines in the delivery of services and to conduct specific awareness campaigns to the population in remote areas and underserved to advance adoption and effectiveness.

Important studies in the implementation of telemedicine highlight the potential and systemic problems. In one of the studies carried out in a medical college in Faridkot, (Shilekh, 2013) found out operational barriers to include shortages of physicians, presence of significant number of unresolved cases, and delays in consultations. Importantly, patient-related issues like low involvement and literacy rate development proved to be significant barriers to the adoption. The comparison of 3,050 cases between the years 2010 and 2012 showed that merely 57.2% cases were completed, 37.8% cases were left incomplete and 5% cases were handled by proxies, consequently confirming the fact that better service delivery models with more awareness programs are actually needed in remote areas.

These findings are later supported and elaborated in later studies. The article by (Gautham et al.2014) elaborated and extensively tested a mobile clinical decision-support system in rural Tamil Nadu (n= 16 providers, 128 patients) and found that it is highly effective and user friendly with both healthcare providers and patients. Conversely (Banerjee et al. 2015) reviewed the experience of telemedicine in West Bengal and Tripura and noted the lack of sufficiently trained heath professionals, rural health literacy, and insufficient training among the staff even with the institutional support of organizations such as ISRO. On the basis of a survey conducted at Manipal, (Subhagata et al.2010) have suggested an innovative model of efficiency, and identified one of the key obstacles of poor ICT infrastructure, and proposed specific organizational changes.

The social and economic aspects of access to healthcare were also studied. In an Indian population survey of 600 residents in the Punjab (Sumninder et al, 2011) found low awareness and cost to be the main reasons why people were not taking up health-insurance. (Remuka et al.2013) and (Nishith et al.2014) examined the dynamics of the Foreign Direct Investment (FDI), alluding to its strategic mobilization in the field of infrastructure development, public education campaigns,

their presence in the super-specialty centers and the upgrades of the digital health system to strengthen the health system.

(Vatsalan et al.2014) highlighted that a multifactorial approach to e-health success do include technological elements, such as decision-support systems, telecommunications, data security; and social elements, including government policy, trust, which were equally important, studies in Uttarakhand found that is true. The last study offering a pilot study regarding record management (n=308 participants in nine months) by (Radha et al. 2014) indicated that active involvement of patients to health records, used via SMS and USB devices, had the potential to boost the utilization of telemedicine.

One more appraisal helped to emphasize the ultimate importance of non-technical impediments. (Kapoor, et al. 2014) listed the lack of good funding, provider resistance and lack of public awareness as some of the biggest barriers to use with specific consideration of lack of specialists that can be available to remote facilities. Using a regression analysis based on survey results, (Bhatia, 2010) claimed that the key to successful telemedicine deployment lies on multi-sectoral partnership, which includes patients/involved, technology development team, health practitioners, and government bodies. In a comparative study (Wani et al. 2013) have addressed that the health services provided in India were still at an evolution stage in comparison with its developed counterparts, and that numerous untapped resources still remain stalling the process of e-quality.

The modern research has placed telemedicine in broad historical and policy contexts. (Kustwar and Ray, 2020) dated back to 1967 and have emphasized how the concept could provide low-cost, easily accessible care to marginalized groups and can close rural-urban healthcare disparities.

Dash, Aarthy, and Mohan (2021) provided a critical evaluation the first telemedicine policy introduced in India that was issued during the COVID-19 crisis. They highlighted the imperative to focus on ethical issues on data confidentiality and security and ineffective digital infrastructure, chiefly the internet access, as one of the major limitations to more widespread use. They at least suggested that telemedicine be integrated into medical curricula and allocation of resources to technology infrastructure in order to improve accessibility.

Chellaiyan, Nirupama and Taneja (2021) have revised the history of telemedicine development, between its invention in the early twentieth century and implementation in modern medicine, with examples of landmark projects in India, such as the (National Telemedicine Taskforce, 2005), and schemes, like ICMR-AROGYASREE and NeHA. They have outlined its different modalities which include asynchronous, synchronous and remote monitoring and its uses in clinical care, education and disaster management but maintain that it is used as a supplement and not a substitute to face-to-face care.

Although telehealth has proven its potential, the lack of awareness and technological resistance of healthcare services providers and the population continue to hinder the early adoption of telehealth (Chellaiyan et al., 2021). However, it is through a philosophical enquiry initiated by (Hassoun, 2015) that the difference between the legal and moral basis of the right to health and the right to healthcare is identified, which highlights the fact that the moral justification of this right is legitimate.

Lastly, (Ramanadhan et al. 2022) has promoted a paradigm-shifting, multiparty framework of telehealth introduction in rural India. They argued that the effectiveness of this program depends on simultaneous developmental improvements in jobs, hygiene and rural facilities. The authors

stated that equity-oriented, socially responsible decisions can be reason to foster sustainable economic development and long-term societal value promotion by facilitating telehealth through the Business of Humanity framework and that such an approach can redesign telehealth as part of an even broader strategy for community development.

To operationalize this concept, the team launched a multi-dimensional demonstration project in Tuver, a tribal village in Gujarat. The initiative was built around seven integrated components:

1. A cooperative governance model promoting shared leadership and diverse expertise
2. The deployment of telehealth technologies
3. Community-centered health education and promotion
4. Digital infrastructure development
5. Reliable electricity supply systems
6. Upgraded water and sanitation facilities
7. Economic empowerment through agribusiness initiatives

The project brought together a coalition of partners, including academic institutions, community leaders, non-profit organizations, telemedicine providers, and infrastructure developers. The evaluation of this research project was conducted by a qualitative case study method, and insights were drawn from administrative data, field visits, and reports of project.

Results showed that addressing healthcare in tandem with different social determinants significantly strengthened community engagement and the effectiveness of telehealth services. A huge success factor was the alignment of stakeholder values and objectives, which formed a functional environment conducive to sustainable development. However, challenges increased, particularly with resistance from tribal populations unfamiliar with digital healthcare tools during

starting phase. The active involvement of local facilitators was helpful in bringing this gap and building rapport and trust within the community.

In conclusion, the early outcomes of this project underscore the potential and the complexities of the work of Humanity approach. It offers a promising roadmap for improving health equity and rural development through integrated strategies but it also highlights the importance of long-term stakeholder engagement and adaptive, systems-oriented planning to meaningful and long-lasting change.

3. Research Gap & Statement of the Problem

Key factors in providing high-quality healthcare to the underserved communities is the technology behind telemedicine, which allows the doctors and underprivileged patients to connect from almost anywhere. Due to the growth of telemedicine, access to healthcare in many rural districts of Gujarat is not limited by distance.

The problem is that poverty and underdevelopment are issues in these areas. They also have to deal with times of unrest. These things have really hurt these areas. The fact that they do not have roads and it is hard to get to these places from other parts of the country is a major issue for the growth of these districts and the development of these districts.. Even with these problems telemedicine and digital pathology are really helping the people in these areas. Telemedicine and digital pathology are making a difference, in the lives of the people who live in these districts. Patients in these far-remote regions can now get medical care locally while consulting with the specialists from larger cities, improving healthcare access and outcomes in places where it was once very difficult to find even basic necessities.

The Telemedicine Practice Guidelines came out in 2020. This made telemedicine legal in India. The goal was to bridge the gap between the healthcare system we have now and the right to health. There are a lot of problems with the rules that govern telemedicine now. We really need laws that're clear and cover everything about telemedicine. This is so we can provide care to people who use telemedicine and also think about the doctors who work with telemedicine. It is very important that everyone can get healthcare when they need it. The Telemedicine Practice Guidelines and telemedicine should make sure that every person has a right, to good health. But especially in Indian geographical rural areas are really getting or not telemedicine implementation and its benefits same as urban areas. The Telemedicine team of rural areas faces the multiple problems to strengthen Telemedicine. Some changes and ideas still need to change and strengthen Telemedicine proper ways in select rural areas.

4. Rationale of the Study

A research study on the effects of telemedicine projects on patient engagement in rural Gujarat has tremendous implications both nationally as well as internationally for achieving greater equity in health care. Through this study, one can establish how telemedicine can work as a solution to complement urban-focused health care infrastructure for poor rural communities. This study will help establish how telemedicine can achieve efficient medical treatments for smaller pockets of people worldwide at much lower costs as has been done in Gujarat by reducing tertiary care footfall by 15% as well as saving ₹50 crores inpatient charges every year.

The stress on overcoming the hurdles of poor digital literacy and poor connectivity can offer some key takeaway lessons for global health policymakers on how infrastructure development and education should be given due emphasis. Further, in a scientific study of

2020- Telemedicine Practice Guidelines in India, there is emphasis on strong frameworks being developed in deriving privacy and security of patients for their data, and how a combined strategy in following frameworks of Business of Humanity can indicate that integration of telemedicine and developments in areas of cleanliness, education, and economics will yield productive health and social developments worldwide. The satisfaction level of several patients and improvement in efficiency of providers make telemedicine a game-changer in realizing the World Health Organization's vision of making health a basic right, providing a doable solution for all countries facing difficulties in accessing health care services.

- Research Questions

1) What are the outcomes and challenges of telemedicine in select rural area?

2) What are the advantages of implementing telemedicine in select rural area?

3) What is the existing regulatory framework governing telemedicine in India?

4) What are the benefits provided by telemedicine compared to the existing healthcare facility?

5) What are the important features and cardinal principles of the Telemedicine Practice Guidelines, 2020?

5. Objectives of the Study

1) To analyse the outcomes and challenges of Telemedicine faced by beneficiaries in selected rural research areas

2) To explore the concept of telemedicine among CHOs, MOs and beneficiaries

3) To analyse the existing regulatory framework governing telemedicine in India

4) To analyse the challenges and experiences of providers (CHOs) and Medical Officers of Telemedicine in selected research areas

5) To propose strategies for bridging the gap between existing healthcare systems and healthcare accessibility through the effective implementation of telemedicine.

6. Hypotheses of the Study

The hypotheses will be tested for the following:

1) The use of telemedicine practice in Gujarat on the performance of the government hospital and its staff.

2) The impact of telemedicine practice in Gujarat on utilisation of public hospitals.

3) The impact of user's perception on faster and effective adoption of telemedicine practices in Gujarat.

7. Research Methodology

7.1 Study design: Observational study

7.1.1 Study type: Mixed Method study

7.1.2 Sampling: From secondary data, total number of C.H.O.s, M.O.s and beneficiaries from selected regions will be obtained and appropriate sampling will be done.

7.1.3. Study participants: C.H.O.s, M.O.s and beneficiaries (patients)

7.1.4. Inclusion criteria:

- All the C.H.O.s from selected regions registered under Govt. of Gujarat
- All the M.O.s from selected regions registered under Govt. of Gujarat
- Beneficiaries more than 18 years of age
- Beneficiaries with minimum 1 teleconsultation

7.1.5. Exclusion criteria:

- C.H.O.s and M.O.s with experience of less than 3 months
- Non-consenting individuals

7.1.6. Study area:

- Quantitative data will be collected from all the regions of Gujarat state

- Qualitative data will be collected from 3 selected regions via appropriate sampling method.
    - Bhavnagar: Saurashtra
    - Gandhinagar: Central Gujarat
    - Surat: South Gujarat

7.2. Data collection:

7.2.1. Quantitative data:

- Gujarat has been divided in total 6 regions by Health department. Data will be collected from following **Secondary sources**:
    - Collecting Healthcare Reports, GoI Guidelines, State Government Guidelines, Telemedicine Websites Materials etc.
    - The study of various literary journals, reviews, leading critical papers, current research work, published articles based on Telemedicine shall be incorporate in the corpus of bibliography.
    - By inviting valuable opinion of critics, discussion with experts, related papers, Research scholars and teachers in India and abroad to authenticate the research work.
    - By referring number of Dissertation and Doctoral Thesis, Articles, Journals, E- books.

- By educational various websites

7.2.2. Qualitative data:

- From total 6 regions, we will include Bhavnagar (Being first region where the program was initiated) and 2 from list of remaining 5 regions; Surat and Gandhinagar were selected using Lottery method.
  - Bhavnagar: Saurashtra
  - Gandhinagar: Central Gujarat
  - Surat: South Gujarat
- Data will be collected from CHOs, MOs and beneficiaries using Questionnaire in local language
- Structured interview using open ended questions in local language for qualitative data

Permissions: Permission from respective department heads leading Telemedicine project will be obtained prior to data collection.

7.2.3. Data collection Method:

When it comes to research, there's no absolute right or wrong method—only the approach that best fits the topic at hand. As a learner, selecting the most appropriate research method can be challenging. After reviewing the approaches of other scholars and considering the research questions and the intended impact of this study, the researcher decided to use qualitative interview

strategies combined with fieldwork. For much of the thesis, observations will be based on existing secondary data sources. In the later stages, a Descriptive Research Design will be employed, using a carefully crafted questionnaire. This questionnaire will be distributed to a stratified random sample of Community Health Officers (C.H.O.s) and Medical Officers (M.O.s) from selected regions. Additionally, the study will include around 100 beneficiaries from each region, totaling approximately 300 participants. Visits to these regions will be organized, with opportunities to meet both staff members and beneficiaries in person.

A simple, general questionnaire will be used to collect data for analysis. Participants will be informed about the study's objectives, assured of the confidentiality of their responses, and provided with feedback on the research findings. To further explore patient perspectives, a scientifically designed questionnaire will be used to gather feedback on various aspects of their healthcare experience, including the ambiance and cleanliness of the facility, promptness of service, adequacy and behavior of staff, interactions with doctors, and overall satisfaction with the services provided. This will also cover whether the facilities align with the costs incurred by patients.

7.3. Variables of the study

Telemedicine is facing several challenges in the rural districts of Gujarat, but, despite these hurdles, its growth is essential. It has the potential to save patients from making time consuming journeys just for brief follow-ups, while also bringing expert medical advice to remote and hard-to-reach areas. To ensure effective implementation of it, clear guidelines need to be established, defining the responsibilities of both the referring doctor and the specialist providing advice via

telemedicine. Also, the nature of the doctor-patient relationship with these backing needs careful consideration.

To see if the telemedicine services are working well, we need to look at numbers like how many teleconsultations are done. We also need to look at things like how long the calls are and what kind of medical advice or prescriptions are given. If hospitals and clinics need a license to do telemedicine then we need to have rules in place to make sure everyone is doing things the same way. This implies that there is a need to have a system so as to regulate telemedicine services and penalize those who do not follow the rules or practice telemedicine without permission. There is an urgent need to regulate telemedicine services and hold the providers accountable.

Firstly, there is the consideration of patients' privacy in healthcare. Telemedicine is prone to risks pertaining to the misuse or unauthorized disclosure of patients' confidentiality. These risks can be managed through effective measures, which cannot be neglected in order to ensure confidentiality in patient information. The success of telemedicine also lies in its technological framework, which has to ensure secured communication, encryption, or safe platforms to prevent data breaches and ensure smooth flow in delivering services.

Telemedicine has immense potential in the closure of the gaps emerging from the conventional systems of healthcare and in the support, it provides for the right to health. But a more organized and integrated approach is needed in the maximum utilization of its benefits and the healthcare issues it has presented, in the rural areas of Gujarat. This requires some prudent modifications in the conventional healthcare system to ensure that telemedicine becomes a strong, safe, and effective aid in the enhancement of healthcare.

7.4. Data Analysis:

It will include a both of quantitative and qualitative approach to comprehensively address objectives. Specific methods will depend on the nature of the data collected, as outlined below:

7.4.1. Quantitative Data Analysis:

Quantitative data will be collected through structured questionnaires and analyzed by statistic methodology for identification patterns, relationships, and significant findings.

The following steps will be undertaken:

- Data cleaning and Preparation:
- Descriptive Analysis:

Frequencies, percentages, mean, medians, and SDs will be calculated to summarize demographic characteristics and key variables.

Graphical representations like bar charts, pie charts, and histograms will describe the distribution of data.

- Inferential Statistics:

Comparison Tests: Statistics tests like the Chi-square test for categorical variables and t-tests or Mann-Whitney U tests for continuous variables will be used to identify differences between groups.

- Correlation and Regression Analysis: Pearson or Spearman correlation tests will be used to determine relationships between given variables. Multivariate regression models may be applied to adjust for potential confounding factors.
- Analysis will be conducted using statistics software such as SPSS, R, or Stata

7.4.2. Qualitative Data Analysis

- Qualitative data will be collected through personal interviews, focused group discussions, or open-ended question survey response. The same will be analyzed using thematic analysis to find patterns, themes, and insights of the data collected. The audio recordings or notes from interviews will be transcribed. NVivo or Atlas.ti will be used to analyse qualitative data systematically for coding and the theme identification.
- The mixed-methods approach - the integration of findings to provide a complete understanding of the research problem. Quantitative findings and qualitative findings will be compared and contrasted to identify convergence and/or divergence. Integration will be performed during the discussion phase to draw connections between empirical trends and narrative insights.
- Quantitative results will be explained or contextualized using qualitative data to add more clarity to the findings. Visual tools such as joint display tables or matrices will present integrated data, highlighting whether qualitative findings corroborate quantitative outcomes.

8. Scope and Limitations of the Study

The above proposed research highlights the primary drawback of telemedicine which is the inability to see and interact with patients face-to-face. The physical examination of patients and one-to-one interactions allow the doctors to pick up on subtle social and physical aspects. These

are very essential for an accurate diagnosis and understanding the patient's actual condition. Telemedicine cannot replace these fundamental and nor is it designed to replace hands-on consultations. Instead, its primary role is to provide remote monitoring for patients with chronic conditions and support basic follow-up care services. It can offer convenience and accessibility, mainly for routine check-ups but it cannot fully replace the depth of information from an in-person visit.

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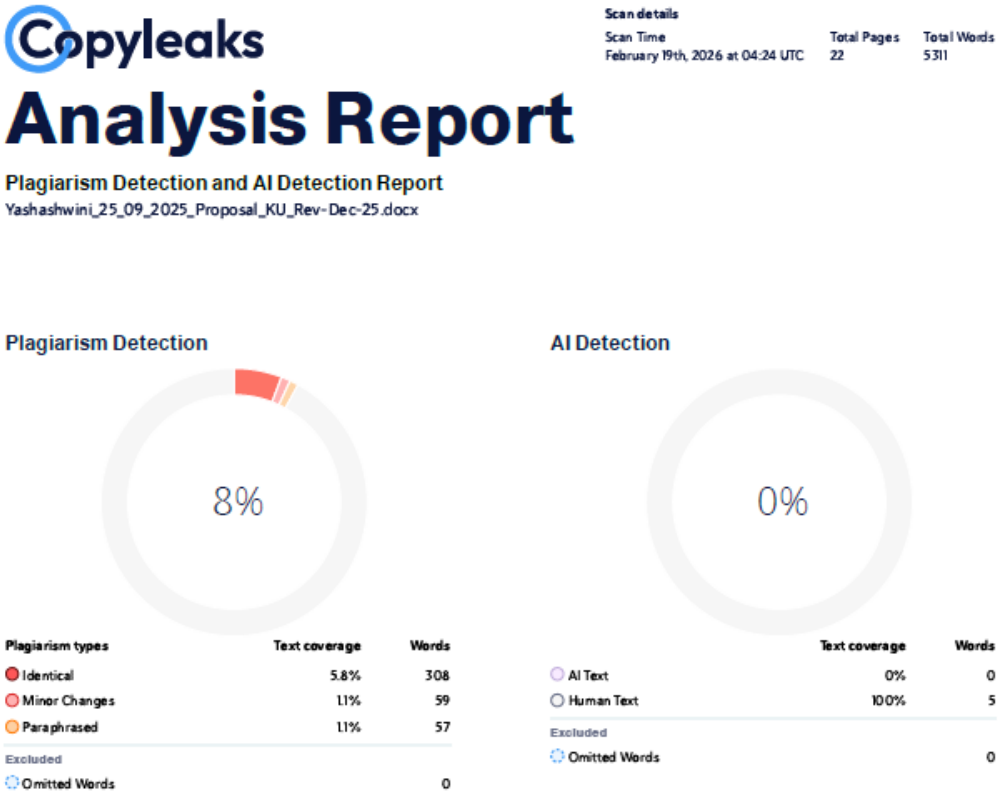
Appendices

Plagiarism and AI Report



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Analysis Report

Plagiarism Detection and AI Detection Report

Yashashwini_25_09_2025_Proposal_KU_Rev-Dec-25.docx

Plagiarism Detection

8%

Plagiarism types	Text coverage	Words
Identical	5.8%	308
Minor Changes	1.1%	59
Paraphrased	1.1%	57
Excluded		
Omitted Words		0

AI Detection

0%

	Text coverage	Words
AI Text	0%	0
Human Text	100%	5
Excluded		
Omitted Words		0

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